

Technological Change and Demographics in a model  
where consumption is time-constrained

*“Why EMEs matter?”*

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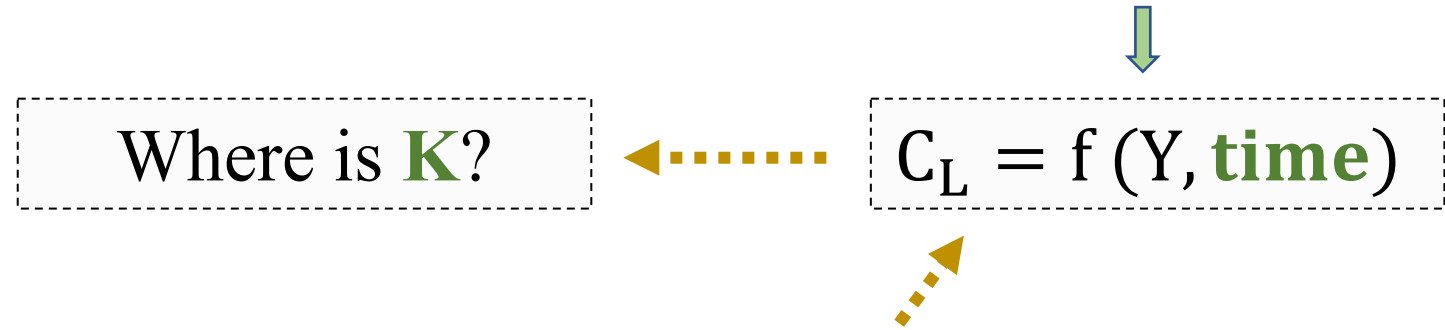
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# Motivation

- Technological Developments in the US in 1980s – mainly *time saving*  
Example: Kitchen appliances
- Since 2000? – in electronics – convergence – time saving
- Crash of 2008 – see Paul Zuckerman, Penguin, 2009. How Paulson bet against wall street!
- Demographics – linked to Economic Growth? How?

# What's the *issue*? (ref; Paulson's trade)

- Keynesian Economics → Consumption ltd. by Income; however now



- K substitutes L in production [ $Y = f(K, L)$ ]; not in consumption, &
- Technology expands prodn, but ↓es consumption

- *Asymmetry; no soln in theory*


# From *Growth Models*..


- Harrod-Domar (1949)

$g = f$  (savings, **K prody**) ~ dynamic version of Keynes

- $g_w, g_n$  &  $g_a \rightarrow 3$  concepts
- Knife-edge?  $g_w = s/k = g_a = g_n$ ; where  $k = K/Y$ .

But,

- Cannot ensure  $g_w = g_a$   *SS Side Model!*
- Key Assumption?

W and K/L are fixed; no role for prody. 

Otherwise why is  $g_w$  fixed?

# ..Cont'd

- Solow-Swan (1956-57) – *Any difference?* [*Ramsay-Cass-K only a dynamic extension- another knife edge involving K/L and C/Y*]

- argued for tech. change – why should k be fixed?
- $\downarrow$  in k  $\rightarrow$   $g_w \uparrow$   $\text{----}\rightarrow$  Again SS side!
- But, also argued that k could change to make

$$s/k = n$$



So n remains the upper bound – Why? N is exogenous.

# Back to *TRADE*

- Classical or Neo-Classical → *All SS side models*
- *Role of Demand* – only after Krugman (New Trade Theory - 1979)
- Post 2000 (Melitz, Antras-Helpman); `heterogenous` firms – still *SS side!*
- Any Role of **time**?
  - Does not exist in Keynes – only Y.
  - Marjit & others: time diff explains outsourcing (SS side | N-S Model)
    - ↘ *increases prody. of time, not L*

# Ques?

**How to explain current stagnation in world DD?**



need '**T**' on the **DD** side (ltd. attempt – *Marjit, Pant & Huria, RIE 2020*)

- Back to  $g_n$

*Why emerging countries matter!*

# A Simple *Analytical Setup*

- Consider Dixit and Stiglitz (1977) / Krugman (1980)  Add the role of “TIME”

## *Assumptions*

- 1 FOP (Labour), producing  $i \in [1, n]$  goods; A *Closed Economy* framework
- Utility Fn of a representative individual/laborer

$$U = \sum_{i=1}^n c_i^\theta \quad \text{s.t.} \quad 0 < \theta < 1$$

- Two constraints

1. Income

$$W \leq \sum_{i=1}^n p_i c_i$$

2. Time

$$T \leq \sum_{i=1}^n t c_i$$

 *time required to consume a variety*



# ...Cont'd

∴ Economy-wide Time Constraint  $\rightarrow \bar{T} = LT$  *“Demographics matter”*

(L: Total Labour Force)

– Production Fn

$$l_i = \alpha + \beta x_i \quad (\alpha, \beta > 0)$$

–  $x_i$  (scale of prodn) = total consumption

$$x_i = Lc_i$$

– Full Employment holds

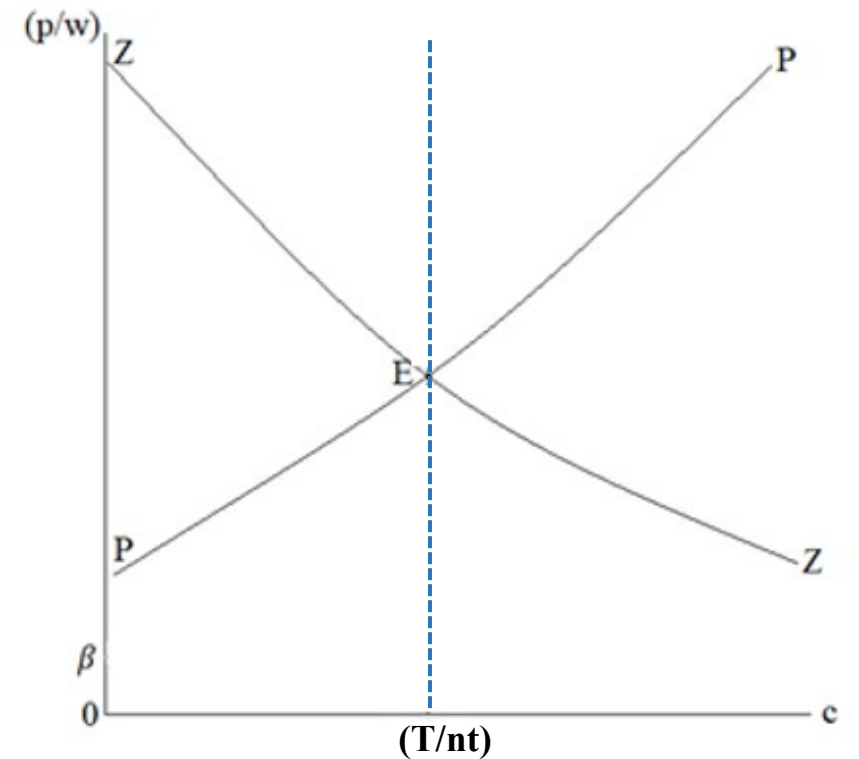
# Is the model *internally consistent*?

# 3 Reduced form equations & 3 unknowns

I. Profit-maximizing behavior of firms:  $p_i/w = \frac{1}{1-1/\varepsilon_i(t)} \beta$   
( $\varepsilon_i$ : elasticity; PP Curve)

II. Zero-Profit Condition:  $(p_i/w)(x_i/\alpha) = 1$   
(ZZ Curve)

III. Full Employment of Labour & Time:  $n = \frac{L}{\alpha \varepsilon_i(t)} = \frac{LT}{x_i t}$

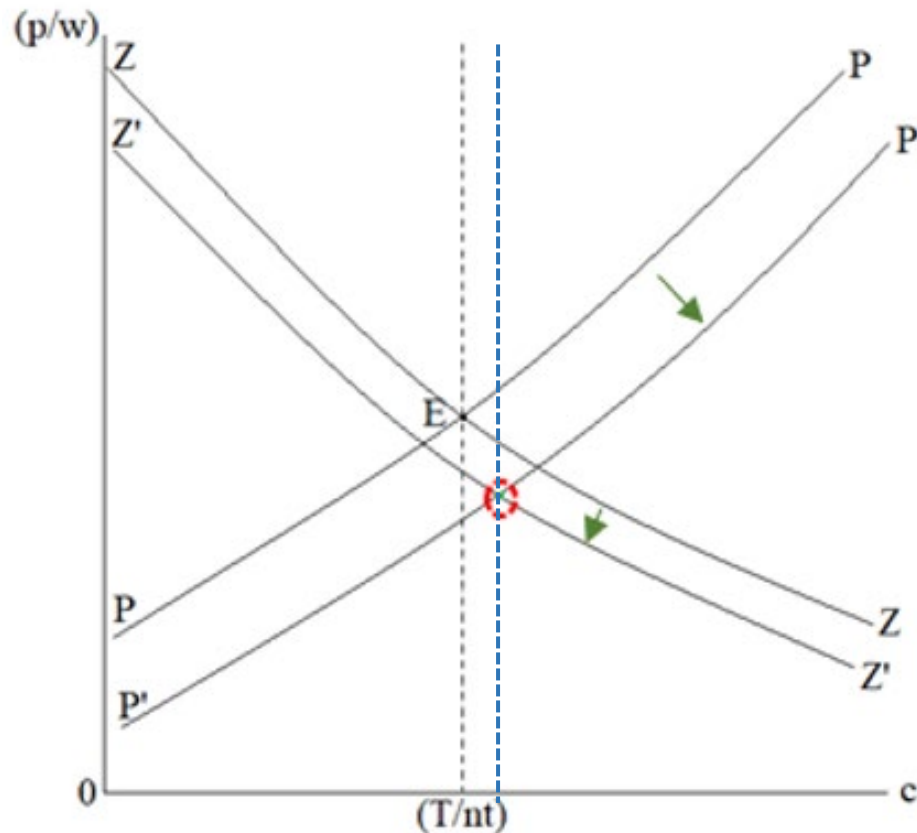


*What's the issue?*

# Cost Saving V/s Time Saving TP



- $\downarrow$  in MC of prodn  $\rightarrow$  higher prodn + tendency for cons to  $\uparrow$



But, cons requires time, not just Y  
(Vertical line doesn't shift)



*Prod-Cons disequilibrium*

**Q. Can Time-Saving TP help?**

$t \downarrow$ es, &  $\therefore$ , cons also  $\uparrow$ es along with  
Prodn



*New equilibrium*

# Role of *Demographics*

- Time Saving TP  $\rightarrow$  higher cons, real income, lower prices, but ‘n’ falls (variety effect is (-)ve)  $\rightarrow$  (Ambiguous) Welfare effect

+

- Can't  $\uparrow$  total available time (T, or  $\bar{T}$ )

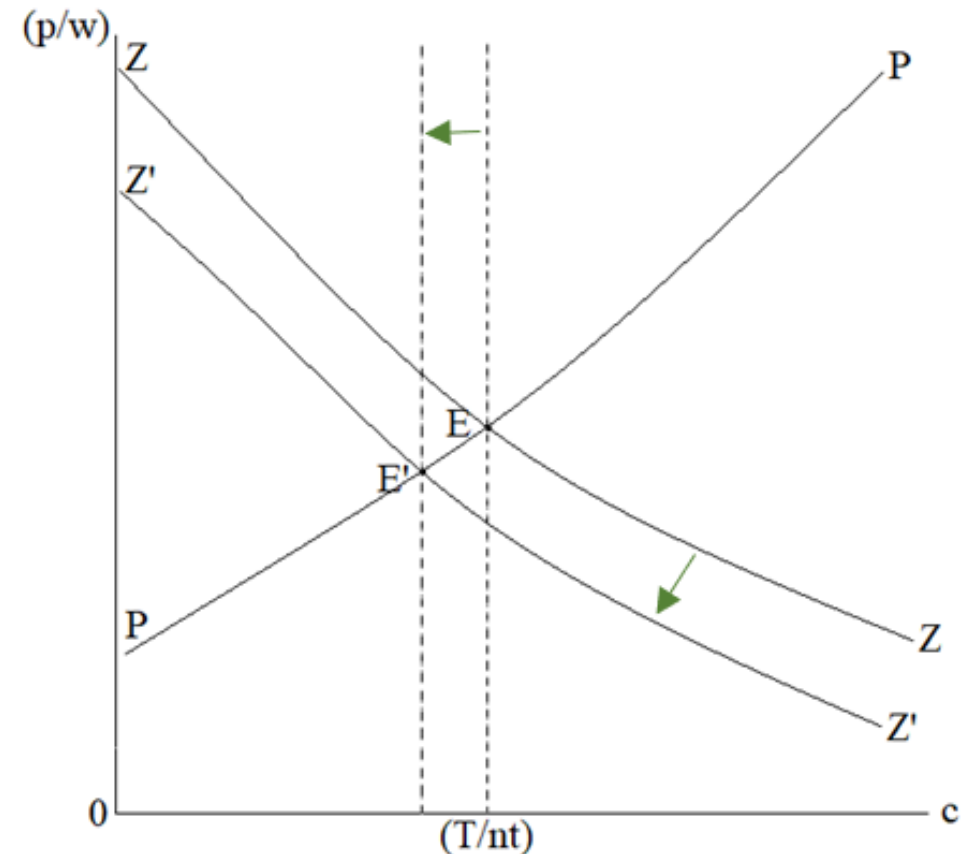
*Any alternative?*

- $\uparrow$  in L (via *immigration*)



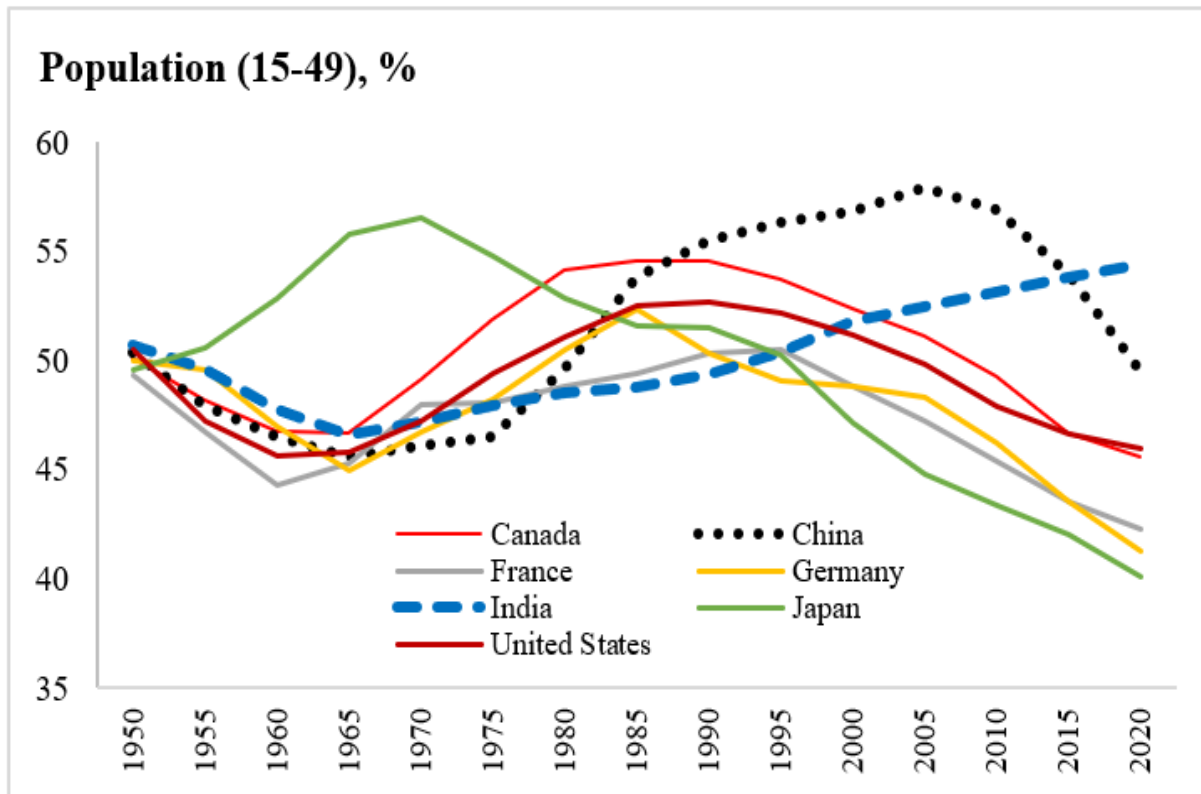
- Effects? Lower prices, higher scale of prodn, higher n, higher real Y

*“Consumer welfare  $\uparrow$ es unambiguously”*



# Some (Un)answered questions

- Why **EMEs** matter?



- Demographic constraints on Cons, or Problem of *Over Production*?
- ‘t’ on Prodn side well-recognized now  
But, On *Demand Side*?  
(partial eqm in micro)
- Purchasing cohorts ↓ing in Dvd Ctries

*India matters in global macroeco*  
(Ruchir Sharma)

# *Some References*

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- Daren Acemoglu and James Robinson – Why Nations Fail
- Marjit, Pant, and Huria, 2020
- The Greatest Trade Ever-Gregory Zukerman, Penguin books, 2009
- Dixit and Stiglitz, 1977
- Krugman, 1979/80

*Thank you!*

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